iNACOL
International Association for K-12 Online Learning

Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Modernizing the E-Rate	)	WC Docket No. 13-184
Program for Schools and Libraries	)	

COMMENTS OF
THE INTERNATIONAL ASSOCIATION FOR K-12 ONLINE LEARNING
IN RESPONSE TO THE
NOTICE OF PROPOSED RULEMAKING

The International Association for K-12 Online Learning ("iNACOL") respectfully submits these comments in response to the Federal Communications Commission's Notice of Proposed Rulemaking seeking to review and modernize the E-Rate program. iNACOL appreciates this opportunity to provide comments to the Commission and applauds the Commission for undertaking this much-needed review and update of the E-Rate program.

I. About iNACOL

The mission of the International Association for K-12 Online Learning (iNACOL) is to ensure all students have access to a world-class education and quality blended and online learning opportunities that prepare them for a lifetime of success. iNACOL is a non-profit organization focused on research; developing policy for student-centered education to ensure equity and access; developing quality standards for emerging

learning models using online, blended, and competency-based education; and supporting the ongoing professional development of classroom, school, district and state leaders for new learning models.

iNACOL has 4,400 members worldwide who teach, administer, support, or advocate for K-12 online and blended learning. iNACOL members include students, parents, educators, researchers, companies, nonprofit organizations and other interested individuals.

iNACOL offers the following comments to assist the Commission in its efforts to achieve this goal and in crafting an E-Rate program that will better serve the needs of schools, libraries, and their students today.

II. Introduction and Background

Ensuring that every student has access to personalized learning environments supported by robust broadband Internet infrastructure is an urgent federal policy issue. Far too many learning environments remain disconnected from experts, digital content, tools, and resources, students need to achieve success in today's society. In order to achieve an equitable education system that prepares our students for success in the 21st Century, we must equip our schools with broadband connectivity to meet the demands of rich digital content, resources, experts, and online assessments that enable student-centered, personalized learning that is accessible anytime, anywhere.

iNACOL urges the FCC to keep the following important ideas in mind as it considers measures to update and strengthen the E-Rate program for the future:

1) E-Rate is a crucial technology infrastructure program with a track record of success increasing equity and empowering teachers and students with the access they need to be successful. Schools need high-speed Internet access for delivering blended, online and digital learning strategies, as they recognize its potential to personalize learning to close the achievement gap and get students college and career ready. The benefits of E-Rate are evident from a survey of iNACOL's membership, half of which receive E-rate funding. Thanks to E-Rate, one school reported being able to provide data cards to homeless and foster youth to allow them to complete assignments and learn outside of structured learning time, increasing equity of access for a significant at-risk population.

2) E-rate needs additional funding to meet schools' needs. By our own estimates, the demand for telecommunications infrastructure improvements in our nation's schools outstrips the program by more than 2:1. Cost and connection speed were overwhelmingly cited in our member survey as barriers to getting adequate high-speed Internet connectivity to support student learning. According to one respondent, even though the online learning opportunities are available to their students, the school does not have adequate bandwidth to provide those opportunities to every student: "We have had a number of Learning Centers who have had to have classes of students not use available computers, because the internet could not accommodate all the users working on their curricula at once." When the E-Rate program first began, schools connected to the Internet via dialup, and applications using computers for learning were more limited than they are today. As the amount of rich online content available for personalizing instruction increases, including adaptive

content, recommendation engines, rich media, video and simulations, the bandwidth demands increase with them; students and educators need an E-Rate program that can keep up with them at any time and place. Just as the authors of the original E-Rate regulations could not have understood the extent to which mobile technology would drive instruction today, we cannot fathom what the future holds five to ten years down the road.

3) The E-rate program should be modernized to support blended and online learning through flexible prioritization of services and a streamlined application process. As the uses and drivers of technology for student learning have evolved, the prioritization of service categories of E-rate are becoming obsolete.

Telecommunications needs of schools for infrastructure and services have changed dramatically in the past decade. iNACOL member schools surveyed cited using the following services and functions to support learning and improving student achievement (irrespective of funding source):

Wireless networks (including equipment necessary to maintain a network such as routers, access points, and computer servers)	94%
Email service	94%
Network maintenance services (includes tech support, repairs, etc.)	89%
Internet access (basic conduit access to the Internet over technologies such as broadband over powerline, cable modems, DSL, fiber, T-1, or dial-up)	89%
Content access, including pay services and subscriptions for online learning resources or databases	89%
Content filtering	83%
Network security services (including firewalls, proxy servers, virtual private networks	78%
Wireless Internet access (provided externally through cellular data plans, mobile hotspots, or aircards)	78%
Web hosting	67%
Digital transmission services (from a school or library to locations beyond the	61%

school or library, i.e. wide area networks or WANs)	
Online backup services	56%
Lit fiber	22%
Dark fiber	11%

As these responses make clear, the prevalence of eligible services actually used by blended and online educators to support student learning are out of step with the priority levels of the E-rate program. The FCC should end sorting eligible service categories by priority levels and allow schools to use their best judgment to determine which broadband-related services are most crucial to meeting student learning needs.

Another barrier to efficient and effective operation of the E-rate program is a complex, convoluted and bureaucratic application process. The FCC should explore ways to reduce the complexity of qualifying for E-Rate, and encourage schools to maximize the programmatic dollars through procurement reforms for telecommunications and technology services, such as bulk purchasing by consortia of schools, districts, or states. By both alleviating the paperwork burden and improving the cost-effectiveness in how funding is spent, funding, applications and processes will be improved and productivity of the program will be maximized. At the same time, the FCC should ensure that the program's funding and oversight processes maintain maximum transparency and efficiency by minimizing waste, fraud, and abuse.

4) Invest today to save billions tomorrow and ensure our students are prepared for college, career, and the 21st Century economy. The FCC has before it an important—and rare—opportunity to make significant updates to a program that is stretched beyond its limits. With improved telecommunications services, digital learning

enables students to gain world-class skills and knowledge at any time, anywhere. Online assessments will be required in the majority of states by the 2014-2015 school year and require increased demands on telecommunications infrastructure. If the Commission does not act now, we put the equity of our educational system at risk. As educators search for effective strategies to close the achievement gap and prepare each student for college and career, the demand for highly personalized blended and online learning will only continue to increase. If the FCC takes actions to help E-rate meet this demand, it will have significant positive effects on our nation's economic health and national security by preparing globally-aware and engaged citizens of tomorrow with the 21st century skills they need to succeed.

III. Increasing the Amount of E-Rate Funds Available for High-Speed Internet Connections to Support 21st Century Teaching and Learning

Investment in digital learning is no longer a luxury but a necessity in today's economy. The United States lags behind many of its economic competitors in student achievement measures. Our system must evolve to support college and career readiness for each student, so they are ready for success in the global economy. While the Elementary and Secondary Education Act of 1965, as amended by the No Child Left Behind Act of 2001, played an important role in shining a light on how subgroups of students were faring, achievement gaps persist. It remains to be seen whether other reforms focused on teacher evaluation and whole school reform are working. However, none of these reforms have focused on strategies to support the learning of individual students.

Across the country, educators are beginning to recognize the promise of blended and online learning to personalize instruction for each student. Sloan reports that seventy percent of school districts offer some form of online or blended learning.[1] EducationNEXT reports that data indicates ten percent of all courses will be computer-based by 2014, and about fifty percent of courses will be delivered online by 2019.[2] Almost two million American elementary and secondary students learn through online courses, with more than half of public school districts offering online courses. A total of twenty-seven states have established statewide virtual schools, while thirty-one states and the District of Columbia offer full-time online school programs. Educators are using digital tools and blended learning strategies to personalize learning, close the achievement gap and get students college and career ready.

While the E-Rate program has been tremendously effective in connecting schools to telecommunications infrastructure, today's schools need high-speed broadband Internet access to support blended, online and digital learning. A common barrier schools face in getting adequate broadband connectivity is cost. Eighty percent of iNACOL members report that cost, both of Internet connections and of wireless infrastructure, is the most significant barrier to providing high-quality digital learning. As a result, demand for E-Rate funds have far outstripped the program's current limits. For FY2013, $4.99B was requested in support, more than double the $2.38B limit for the program.

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[1] Babson Survey Research Group and College Board. "10th Annual Survey of Online Learning." *The Sloan Consortium*, 2012. sloanconsortium.org/publications/survey/pdf/K-12_Online_Learning.pdf

[2] Horn, Michael B. and Clayton Christensen. "How Do We Transform Our Schools?" *EducationNext*, Vol. 8, No. 3, Summer 2008. http://educationnext.org/how-do-we-transform-our-schools/

With E-Rate unable to meet all requests, too many learning environments remain disconnected from crucial modern digital content and tools due to the quality of their connection. Reaching the President's goal of connecting ninety-nine percent of all schools with high-speed broadband within five years requires that the program not only meet the current levels of E-Rate demand, but also fund long-term investments in technological infrastructure to ready our schools and libraries for the increasing bandwidth demands of high-quality blended and online learning and assessment. Therefore, we urge the Commission to fully equip the E-Rate program to meet modern demands by increasing the funding limit to a level commensurate with demand.

iNACOL believes that this will be crucial to meeting the Commission's goal of modernizing the E-Rate program to ensure that schools and libraries have affordable access to 21st Century broadband that supports digital learning.[3] As more schools adopt new learning models powered by blended and online learning, only a fully funded E-Rate program can provide sufficient opportunity for schools, libraries and other learning environments to secure essential broadband access for the country's students. The future success of our students — and therefore the US economy — depends on it.

IV. **Broadband Connectivity to Support the Instruction Students Need for Success**

The FCC has asked what appropriate target goals are for a broadband connection that supports digital learning.[4] A study conducted by the LEAD Commission

[3] *E-Rate NPRM*, ¶56.
[4] *E-Rate NPRM*, ¶20-38.

concluded that the average school would require 100 megabits of bandwidth per 1,000 users to ensure sufficient capacity for students to engage in digital learning campus-wide.[5] This requirement increases to a gigabyte per 1,000 users in 2017.[6]

However, figures reported by EducationSuperHighway and accepted by the LEAD Commission show that most schools do not have this level of connectivity. Only twenty-three percent of our nation's schools have the high-speed bandwidth necessary to support high-quality digital content and online assessment, and less than ten percent have broadband that will be sufficient for projected demands in 2017.[7] For instance, one iNACOL member reported having to restrict the number of students who could access online instruction because their connection could not accommodate the simultaneous load.

Moreover, the LEAD Commission reports that data collected from EducationSuperHighway and by the FCC itself indicate that over eighty-three percent of K-12 schools have outdated wireless networks.[8] The lack of sufficient wireless connectivity greatly limits the bandwidth available to individual classrooms regardless of the quality of the school's reported bandwidth capabilities.

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[5] The LEAD Commission. "Paving a Path Forward for Digital Learning in the United States," June 2013. http://www.leadcommission.org/sites/default/files/LEAD%20Commission%20Blueprint.pdf

[6] Ibid.

[7] Coulter, James G. Testimony before the Senate Committee on Commerce, Science and Transportation, Hearing on "E-Rate 2.0: Connecting Every Child to the Transformative Power of Technology," July 17, 2013. http://www.commerce.senate.gov/public/?a=Files.Serve&File_id=45344d1a-c57f-4869-ae66-f40d62afe8d6

[8] *See* LEAD Commission at 2.

The Commission should strive to ensure that schools have high quality Internet connections and internal networks that can meet the bandwidth demands of modern learning environments. As the Commission notes in the NPRM, the increasingly accepted standard envisions a high-capacity fiber line to the school that is subsequently distributed to the school campus via an internal wireless network.[9] In the vast majority of circumstances, this represents a good baseline for the infrastructure necessary to support digital learning.

However, new advances in technology and subsequent market shifts could render any architectural model obsolete. When the E-Rate program first began, 56-kilobyte dial-up connections were standard and sufficient for the day's bandwidth demands. The program's original designers could not have foreseen the type of rich online content and systems of assessments that support instruction today or the technological infrastructure necessary to support it. Similarly, we cannot fathom the full extent of drivers and demands five to ten years down the road. It is also important that the Commission remain mindful that every school, district, and library faces its own unique challenges in bringing digital learning to students. For example, in some remote and low-population regions where fiber is prohibitively expensive, schools and libraries may be better served by microwave or satellite based connections.

The Commission is rightfully cautious about embedding any preferences for a particular technology or model of connectivity, fiber or otherwise, in the E-Rate

[9] *E-Rate NPRM*, ¶67.

program.[10] Similarly, while the Commission is correct that high-quality connections include elements other than speed, the Commission should proceed carefully before integrating any performance requirements associated with connections.[11] Such requirements may prove onerous to schools and libraries and restrict their options. Instead, the Commission should ensure that E-rate's provisions are flexible enough to adapt to emerging learning environments over the coming years.

V. A Transformed E-Rate Program, Adaptable to Emerging 21st Century Learning Environments

With the E-Rate program already unable to meet demand for priority two services, mere expansion of the program would threaten to stretch resources thin when schools and libraries are already struggling to receive funds. Ensuring the availability of adequate support for broadband connectivity to and within schools and libraries requires a *transformation* of the E-Rate program. It is important that the Commission not only increases support for digital learning, but also modernizes the program in a manner that both curbs waste and rewards good stewardship.

A. A More Flexible and Streamlined Program

iNACOL believes that students and educators are best served by a flexible E-Rate program that can adapt to the progress of technology and also recognizes that individual schools, school districts, and libraries are best equipped to determine the right solutions to their own evolving connectivity needs. Therefore, we urge the Commission

[10] *E-Rate NPRM*, ¶77.
[11] *E-Rate NPRM*, ¶28.

to update the E-Rate program in a way that empowers schools and libraries to address their specific digital learning needs.

In particular, the Commission should heavily re-examine the current priority system. Since priority two funding is not guaranteed, applicants are incented to request priority one services in order to maximize guaranteed funding even if they would be better and more efficiently served by a priority two service. The Commission could reduce this inefficiency by creating a single list of eligible services, effectively removing the incentive to game the priority system.

The Commission should also consider ways in which the process of applying for E-Rate can be streamlined. The complexity of the current E-Rate application system has resulted in the vast majority of schools and libraries needing to rely on a specialized E-Rate coordinator to guide them through the application process.

B. Expanding the Scope of Broadband Support

iNACOL applauds the FCC for its recognition that we must not only ensure schools and libraries have access to affordable high-capacity broadband, but also access to services and equipment that allow them to effectively disseminate and utilize those connections.[12] Indeed, our members report that there is need for greater support for e-learning infrastructure—including external content providers, learning management systems, network maintenance, and security services—in addition to greater connection support.

[12] *E-Rate NPRM*, ¶65.

It is essential for the Commission to ensure that schools and libraries have the necessary support for wireless infrastructure. As the Commission has noted, the designation of internal connections as a priority two service in the current E-Rate program has effectively made funding for internal connections unavailable.[13] Consequently, many schools still struggle with classroom connectivity due to an inability to install or update their wireless infrastructure. By a margin of 15-to-1, iNACOL members report utilizing wireless networks in order to bring connectivity to the classroom, reporting that the cost of these networks are one of the largest barriers they face. Should the Commission decide not to eliminate the priority system, it would be prudent to explore alternative designs that will allow internal connections, including the related equipment maintenance and installation services, to be funded with the same priority as primary connections. Ensuring that students across a campus are able to effectively utilize their school's connection will do more to ensure that students have access to rich digital learning content and assessments than funding connections that only reach the front door.

An overwhelming majority of iNACOL members surveyed, over eighty-seven percent, also report relying on external content providers and learning management systems to support student learning. Eighty percent also report relying on network maintenance and security services to maintain their connections for student usage. As crucial components in online and blended learning models, the Commission should give serious consideration to allowing schools and libraries to use part of their E-Rate funds for such services.

[13] *E-Rate NPRM*, ¶83.

C. New Solutions to Manage Costs

The number one barrier to adequate high-speed internet connectivity for over eighty percent of iNACOL members is cost. Many schools lack options for getting the connections they need at acceptable prices. However, consortia of schools, districts, or states are generally able to attain more competitive rates by utilizing greater leverage. The FCC should explore ways in which it can better facilitate and encourage such bulk purchasing.[14] The Commission can also consider methods to create a more robust bidding process, both inside and outside of consortia purchases, to ensure reasonable pricing.

Investment in new or upgraded infrastructure, such as wide area networks or the use of privately owned or leased fiber networks, can also generate savings in the long term. The Commission should endeavor to make sure that the necessary support for such infrastructure projects exists.

As the Commission notes, many of the services currently supported under E-Rate have become obsolete.[15] Of iNACOL members surveyed, over seventy-eight percent would support the removal of landline telephone services as an eligible service in order to expand support for broadband access, infrastructure, or equipment. While iNACOL supports the transition of the E-Rate to a broadband centric program, the Commission should ensure that it does not abruptly terminate support for services that schools and libraries rely on.

[14] *E-Rate NPRM*, ¶88.
[15] *E-Rate NPRM*, ¶90.

In many cases, such as voice calling, technology has advanced to the point where Internet connectivity is a viable substitute for traditional service. iNACOL encourages the FCC to explore ways to encourage the adoption of such alternatives to traditional landline telephone services. Seventy percent of iNACOL members report being able to transition their traditional telephone services to IP based solutions without negative impact on student learning.

D. Ensuring Equity

Currently, the E-Rate program is able to fulfill most priority one funding requests but cannot completely fullfill priority two requests. This has created a well-known disparity in the types of services E-Rate has been able to fund. However, should the Commission revise the program to eliminate the distinction in priorities, a different disparity may arise, between an expanded array of services supported and high discount applicants being funded first; there is a possibility that the entire program budget could be spent on requests from high discount rate schools before lower discount rate schools receive funding. With eighty percent of iNACOL members surveyed citing cost as their top barrier to adequate high-speed internet connectivity, we believe that ensuring that all schools and libraries have access to fair amounts of funding should be a top concern.

While schools serving our most disadvantaged students need and deserve access to resources necessary to make online and blended learning available to their students, the current E-Rate system allows applicants with the highest discount rates to request a disproportionately high amount of funding. Funds for Learning reports that the

average funding request per student for telecommunications and Internet connectivity is approximately $57 (rising to $129 in remote rural areas).[16] However the New York City Board of Education request per student was $281 per student – nearly five times the national average and over four times the average for schools located in large cities.[17]

The Commission must guarantee good stewardship of E-Rate funds so that all applicants receive a fair share. As such, iNACOL encourages the Commission to explore administering E-Rate funds on a budget-based system. Baseline funding can be determined on a per-student or per-patron basis, modified by the institution's current discount rate. To ensure adequate funding for smaller schools and libraries, or those located in remote and locations where broadband communications services are more expensive, additional modifiers and budget floors can be added. Such a system would offer all applicants access to some level of yearly E-Rate support and allow applicants to set their own priorities, while encouraging applicants to make efficient use of E-Rate funds.

E. Facilitating Learning Outside the Classroom

One of the most prominent advantages of online and blended learning models is that they afford their students greater flexibility in schedule, allowing the learning process to continue beyond the time provided in the classroom. However this flexibility depends on connectivity both in and out of the classroom, something that campus networks often cannot provide.

[16] Funds for Learning. "E-Rate 2.0 Proposal." July 17, 2013.
[17] Ibid.

When schools and libraries close for the evening, it is our nation's most disadvantaged students whose academic progress suffers the most. As the Wall Street Journal reported earlier this year, an alarming number of students must resort to studying and completing assignments at fast food restaurants with free wireless Internet because they lack Internet access at home.[18] Cognizant of the burden placed on students without Internet access at home, educators may be deterred from integrating digital content into lessons.[19] Schools implementing blended learning models have found that the lack of universal home Internet access has hampered students.[20]

The Commission solicited comments on the provision of Internet service via completely wireless solutions, such as cellular data plans and air cards, given the high costs associated with such service.[21] While the Commission is correct that connectivity can usually be provided more efficiently on campus through a campus LAN, such LANs are inherently limited. A 21st Century, anytime, anywhere education system that prizes learning beyond the classroom must be supported by connectivity outside the classroom. Moreover, online schools that do not have physical classrooms are largely excluded from a system that places a priority on LAN-based connections. As such, the Commission should proceed with caution before phasing out support for cellular data

[18] Trioanovski, Anton. "The Web-Deprived Study at McDonald's." *The Wall Street Journal,* January 28, 2013. http://online.wsj.com/article/SB10001424127887324731304578189794161056954.html
[19] Ibid.
[20] Bernatek, Brad; Cohen, Jeffrey; Hanlon, John; and Mathhew Wilka. "Blended Learning in Practice: Case Studies from Leading Schools." *The Michael and Susan Dell Foundation,* September 2012. http://5a03f68e230384a218e0-938ec019df699e606c950a5614b999bd.r33.cf2.rackcdn.com/msdf_firstline_06.pdf
[21] *E-Rate NPRM*, ¶102.

plans and air cards, as these services are often consciously chosen by schools to provide students with anytime, anywhere learning opportunities.

Furthermore, the E-rate currently requires a pro-rating of the cost of cellular data plans and air cards to the time they are used within the school building. In addition to maintaining support for off-campus data plans and air cards, the Commission should give great consideration to relaxing restrictions that prohibit schools from making their E-rate-funded connections available to students outside classroom hours or campus boundaries. With the tandem proliferation of (1) the increasing use of wireless networks in school buildings which obviate the need for most data connections on campus, and (2) the proliferation of anytime, anywhere learning opportunities as an essential tool to increase student achievement, the E-rate program could increase efficiency by allowing the use of cellular data plans and air cards for educators and students to use technology for teaching and learning outside of the school building.

Students without access to the Internet at home suffer from an inequity of access to online, blended, and flipped learning experiences. iNACOL applauds the Commission for its efforts in bringing connectivity to students and their communities through its efforts in at-home broadband projects, such as the Lifeline Broadband Pilot and Connect2Compete.[22] With the success of online and flipped learning dependent upon students having access to critical online and digital learning tools at home, these programs serve an essential role in closing the digital divide by ensuring that all students have access to the highest quality of education.

[22] The Wireline Competition Bureau. "In the Matter of Lifeline and Link Up Reform and Modernization." December 19, 2012. http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-12-2045A1.pdf

VI. **Measuring the Educational Impact of E-Rate**

In the NPRM, the Commission has asked whether there is a way to measure how success in the classroom is affected by access to E-Rate funding or services supported by E-Rate.[23]

The Commission noted particular concern regarding a study by Austan Goolsbee and Jonathan Guryan conducted in California that showed E-Rate supported substantially increased investment in Internet and communications technologies by schools but had no significant effect on student test scores. Contrary to the study, testing results in California's Lake Elsinore district show that Southern California Online Academy had some of the district's highest scores.[24] Two Rocketship schools utilizing a blended school platform place fifth and fifteenth amongst all California schools with seventy percent or more students eligible for free lunch.[25]

More importantly, though, this study should not be understood as evidence of digital learning's inefficacy. The authors noted that the study did not measure how teachers utilized time in the classroom and therefore the study could only be an assessment of "the effect of Internet *access* and not of Internet *usage.*"[26] As such it should not be interpreted as an indictment of digital learning, or upon the E-Rate

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[23] *E-Rate NPRM*, ¶40.

[24] LakeElsinore-Wildomar Patch. "Lake Elsinore's Online School Beats Averages In Latest Test Results." August 29, 2013. http://lakeelsinore-wildomar.patch.com/groups/schools/p/lake-elsinores-online-school-beats-averages-in-latest-test-results

[25] BusinessWire. "Second Rocketship School Catapults into Top 15 with Outstanding Student Achievement." September 13, 2010. http://www.reuters.com/article/2010/09/13/idUS168135+13-Sep-2010+BW20100913

[26] Goolsbee, Austan and Guryan, Jonathan, "The Impact of Internet Subsidies in Public Schools" at Pg. 15, *88 Review of Economics and Statistics 336,* May 2006. http://faculty.chicagobooth.edu/austan.goolsbee/research/erate.pdf

program's ability to make an educational impact by supporting online and blended learning models.

Rather, the Goolsbee and Guryan study shows the insufficiency of mere access, highlighting the need to reform E-Rate to better address the telecommunications needs of schools and libraries to provide 21st Century learning environments. Indeed, the Commission itself has recognized that while E-Rate has been tremendously effective in connecting schools and libraries to the Internet, many of these schools and libraries have been connected via dial-up or at otherwise insufficient speeds to properly support digital learning in the classroom. Many more schools have broadband access, but struggle in bringing digital learning to the classroom as a result of poor internal connections and inadequate support.

Therefore, iNACOL discourages the Commission from measuring the effectiveness of E-Rate using student achievement data. Instead, the Commission should investigate the extent to which schools and libraries have the broadband, internal connections, and e-learning technologies necessary to support rich online content and assessment. Effectiveness studies of educational programs must control for the multiple factors involved in student learning. Rather, studies should look at how connectivity can be or has been used to change the design, delivery and support of learning experiences to improve outcomes. The potential of blended learning is unquestioned; what needs to be explored is how connectivity positively changes

practices. [27] Knowing the extent to which high quality digital learning offerings are present in US schools and how such offerings have helped to increase student access to that content are important questions that are best answered by evaluations of programs focused on directly disseminating such practices.

Several research studies have affirmed the effectiveness of both online and blended learning environments. In 2009, the U.S. Department of Education concluded that online learning is effective, stating that, “The meta-analysis found that, on average, students in online learning environments performed better than those receiving face-to-face instruction.”[28] Another study conducted by Learning Point Associates found that online learning is “equal or better” than traditional face-to-face, lecture courses reporting, “[O]ne conclusion seems clear: on average, students seem to perform equally well or better academically in online learning.”[29] Moreover, the study found that the training that teachers underwent to teach online improved teaching in both online and face-to-face settings: “Of those who reported teaching face-to-face while teaching online or subsequently, three in four reported a positive impact on their face-to-face teaching.”[30]

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[27] Horn, Michael. "Avoid the Hype: Online Learning's Transformative Potential." *Forbes*, June 6, 2013. http://www.forbes.com/sites/michaelhorn/2013/06/06/avoid-the-hype-online-learnings-transformational-potential/

[28] US Department of Education. "Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies." Revised September 2010. http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf

[29] Smith, Rosina; Clark, Tom; and Robert L. Blomeyer, "A Synthesis of New Research on K-12 Online Learning." *Learning Point Associates*, November 2005. http://www.riversidevirtualschool.net/RVS/Website/Publications/Online%20Teaching%20and%20Learning/A_Synthesis_on_New_Research_on_K-12_Online_Learning.pdf

[30] Ibid.

Online and blended learning combine the best strengths of high-quality teaching, online content, digital tools, technology, and collaboration to support student achievement. Online courses empower educators to personalize their students' education by using real-time data pulled from technology systems to differentiate instruction to meet each student's individual strengths and needs. In fact, the very redesign process of integrating digital content entails a paradigm shift that re-centers the instruction around students; teachers and instructors examine and rethink every lesson, reevaluating the appropriate use of time and attention in lieu of opportunities beyond the classroom provided by digital content. The result is an education that fosters a higher order of thinking and deeper level of learning.

VOISE Academy, a high school in the Chicago Public School District has generated some of the strongest achievement growth in the district thanks to its blended learning school design. In Omaha, adoption of a new online credit recovery system reduced the number of students who failed Algebra 1 a second time by thirty percent.[31] One iNACOL member reports that Internet connectivity has helped their school district place amongst the top of their state's test scores.

Digital learning also offers benefits beyond that which can be measured by test scores. Such courses not only boost student achievement, but also increase student access and engagement. For instance, in the case of Mandarin Chinese, students in online and blended courses have the benefit of being collaboratively taught by both instructors in the US and in Beijing and have the opportunity to practice their language

[31] Traditional credit recovery (summer school) resulted in thirty-five percent of students failing Algebra 1 twice compared to only five percent in the new online credit recovery system.

skills by interacting online peer-to-peer with students from China, developing both language skills and cultural understanding.

It is our most disadvantaged students that have, and will continue to be, served greatest by the growth of digitally supported learning.

Carpe Diem, a middle and high school in Yuma, Arizona that utilizes a digital learning model, has outpaced the average Arizona school despite a student body with forty-six percent of students on free or reduced price lunch.[32] Carpe Diem has led Yuma County in achievement scores for four years, and led the state in growth for the last two.[33] Carpe Diem also boasts a graduation rate twenty-five percent higher than the Arizona state average.[34]

Touchstone Education, a charter school in Newark, New Jersey, serving a 100 percent minority and 90 percent poverty student body, has also experienced great success with a blended-learning model. Public Impact reports growth in Touchstone's average reading and math grade levels as well as a ninety-four percent attendance rate.[35]

In remote rural geographic and poor areas, teacher shortages can be a significant challenge, especially in STEM and critical subject areas. Online and blended

[32] Pandolfo, Nick, "Education Nation: In Arizona desert, a charter school competes," *The Hecinger Report*, September 24, 2012. http://hechingerreport.org/content/education-nation-in-arizona-desert-a-charter-school-competes_9687/
[33] The LEAD Commission. "In Depth: Carpe Diem." http://www.leadcommission.org/in-depth/carpe-diem
[34] Ibid.
[35] Public Impact, "Touchstone Education: An Opportunity Culture Case Study," 2013. http://opportunityculture.org/wp-content/uploads/2013/07/Touchstone_Education_An_Opportunity_Culture_Case_Study-Public_Impact.pdf

courses increase equity in student access to quality teachers and curriculum. A NCES study on K-12 distance learning showed that the primary reason K-12 school districts offer online courses is that some courses would otherwise be unavailable in local schools.[36] Forty percent of public school districts say they utilize online learning resources because certified teachers are not available for traditional face-to-face instruction in many subjects.[37]

Currently, forty percent of high schools in the U.S. do not offer AP courses.[38] However, through online courses, every high school student in Virginia, Michigan and Kentucky has access to AP courses.[39] The International Baccalaureate program offers an IB Online Diploma Program across 125 countries, taught by master teachers with online teaching methods, rigorous digital curriculum, and collaborative online discussion rooms and digital tools.[40] Moreover, online and blended learning models also allow schools to serve a wider reach of students. In Illinois, Youth Connection Charter School serves over-aged and under-credited high school dropouts and guide them toward their diploma using blended models and the Illinois virtual achool offers more than 130 online

[36] Queen, Barbara and Laurie Lewis. "Distance Education Courses for Public Elementary and Secondary School Students: 2009-10." *National Center for Education Statistics.* November 2011. http://nces.ed.gov/pubs2012/2012008.pdf
[37] Ibid.
[38] U.S. Department of Education. "Expanding the Advanced Placement Incentive Program." 2006. http://www.ed.gov/about/inits/ed/competitiveness/expanding-apip.html
[39] Education Commission of the States. "Advanced Placement." 2013. http://www.ecs.org/html/educationissues/highschool/highschooldb1_intro.asp?topic=ap
[40] International Baccalaureate Diploma Programme courses online, 2013, http://www.ibo.org/diploma/development/dponline/index.cfm

courses for advanced placement ("AP"), credit recovery, and enrichment that all meet state learning standards.[41]

VII. Conclusion

Blended and online learning is leveling the playing field to ensure that every student has access to a high-quality, personalized, world-class education that prepares him or her for a lifetime of success, regardless of his/her zip code or socio-economic background. Students' access to these educational opportunities depends on adequate broadband connectivity in schools, homes and communities. A successful E-Rate program is crucial to attaining the school and library connectivity necessary for students to reap the benefits of blended and online learning environments.

We applaud the Commission for considering crucial updates to the E-rate program and encourage it to give serious consideration to adopting the recommendations contained in iNACOL's comments. Doing so will ensure that our students have access to the tools they need to succeed in college, career, and the 21st Century economy.

[41] Indiana Urban Education Solutions. "Charter School Application Proposal Before the Indiana Charter School Board." April 9, 2012. http://www.in.gov/icsb/files/passportindiana-urban-education-solutionsatt25-app-full.pdf

Respectfully submitted,

Maria Worthen
Vice President of Federal and State Policy
iNACOL

Susan Patrick
President and CEO
iNACOL

Christopher Paredes
Broadband Policy Fellow
iNACOL

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iNACOL
1934 Old Gallows Road, Suite 350
Vienna, VA 22182
(703) 752-6216
www.inacol.org